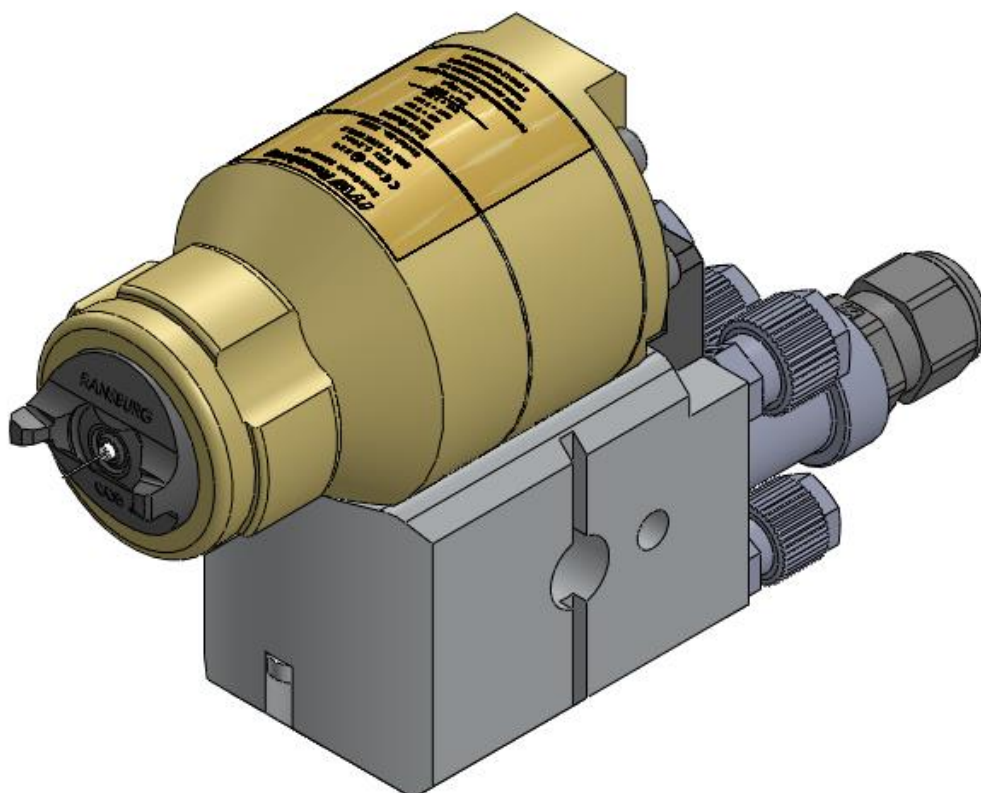


Service Manual

ELECTROSTATIC AUTOMATIC APPLICATOR ESTAQUICK AEMD-600



CE 0518  II 2 G

EEx 0.24 mJ
SIRA 11ATEX5240X

Before using this equipment, carefully read the Safety and Safety Precautions sections and all instructions in this manual. Keep this Service Manual for future reference.

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1 General

1.1 *About this Manual*

- This service manual applies exclusively to the electrostatic automatic applicator EstaQuick AEMD-600 for the application of solvent-based paints.
- The information in this document is intended only to indicate the components and their working relationship in typical use. These are not installation instructions. Each installation is unique and should be directed by a FINISHING BRANDS RANSBURG representative.
- This manual provides information for the service and maintenance of this RANSBURG electrostatic equipment at a typical installation configuration. While this manual lists standard specifications and service procedures, some minor deviations may be found between this literature and your equipment.
- Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier trouble-shooting.
- Please conduct the specified tests and checks before requesting service assistance, and have this manual in hand for ready reference when requesting such assistance. We recommend that maintenance and operating personnel who are familiar with the service problem be authorized to contact us when service is required.
- Separate service manuals are available for different adapters and accessory equipment.

1.2 Electrostatic Automatic Applicator EstaQuick AEMD-600

The electrostatic automatic applicator EstaQuick AEMD-600 (in the following called EstaQuick) is an air atomizing electrostatic automatic spray gun.

The EstaQuick is equipped with a quick disconnect system. The gun disconnects for service quickly thanks to an easy $\frac{1}{4}$ turn mounting bracket which includes all fluid lines, air lines, and the high voltage line.

The EstaQuick is suitable for use on hollow-wrist or flex arm robots or with automatic machines (reciprocators), or supports. The EstaQuick applies a voltage of up to 90 kV to the atomizing point of the coating material. The charged particles are attracted to, and deposited on, the target object. The forces between the charged particles and the grounded target are sufficient to turn most normal overspray around and deposit it on the side and back surfaces of the target. Therefore, a high percentage of the spray is deposited on the target. The guns of this series are suitable for coating materials on solvent or water base.



Note

This service manual applies exclusively to hazard situations when operating with solvent-based paints. For the application of water dilutable paints the relevant service manual is valid.



Note

Both the gun and the interconnection with the high voltage control unit and high voltage cable have to be regarded as installation components which do not represent an operative complete system. Therefore, a EC type examination (ATEX Certificate) cannot be established. An operative installation will only be developed in combination with the spray booth (i.e. ventilation and drawing-off air).



Note

CE/ATEX approval with this power source is only for the EstaQuick

1.3 Components

The EstaQuick installation consists of the gun, an adapter, the air and fluid line, and the high voltage control unit incl. Low- and High Voltage Cable.

1.4 Symbols



Information

Information you should pay special attention to.



Note

Important text passage you should pay special attention to.



Caution

Important information that tells how to prevent damage to equipment or how to avoid a hazardous situation.

2 Safety Precautions

2.1 Intended Use



Caution

This installation can be dangerous if the instructions of this service manual are not being followed!

The EstaQuick is designed and built for operation in stationary electrostatic spraying installations for flammable liquid spray materials.

The EstaQuick must only be operated in potentially explosive atmospheres which are created by the spraying cloud of the used coating material itself.

2.2 Training

2.4.1 It is extremely important that equipment operators and supervisory personnel understand the safe operation requirements. All personnel must be adequately trained prior to operating the electrostatic equipment and accessories. Operators must be given adequate training at least once a year.

2.3 Use of Electrostatic Spray Systems in Potentially Explosive Atmospheres

2.3.1 Electrostatic spraying systems (spray guns) must only be operated in potentially explosive atmospheres where the potential hazard is exclusively caused by electrostatic spraying of flammable liquid coating materials.

2.3.2 Electrostatic spraying systems must only be operated if protective measures against typical endangering have been taken into consideration. It must also be secured that protective measures have been taken to avoid dangerous body current by

- avoiding unnecessary work at live installation components
- closing current less
- appropriate work wear
- protection against unintended reclosing
- determination of stress freeness
- grounding and short-out
- release for operation (allowance to pass)

2.4 Work Areas

- 2.4.1 Always ensure that there are no ignition sources. Smoking and open fire in potentially explosive atmospheres must be forbidden.
- 2.4.2 Paint must never be permitted to accumulate in spray booths, spray stands, and in the work area.
- 2.4.3 Coating of hollow parts in which hazardous situations may occur due to gas, mist, or dust of the coating material must be forbidden, unless protective measures are taken.
- 2.4.4 It must be pointed out and checked that entrance doors at the spray booths are kept close during the spraying process.

2.5 Inside Coating of Hollow Parts

- 2.5.1 Inside coating of hollow parts in which hazardous situations may occur due to gas, mist, or dust of the coating material must be forbidden, unless special safety measure are taken.

2.6 Cleaning

- 2.6.1 Paint deposit of coating material must be removed in regular periods. Special care must be taken to clean the spray booth including suction plant, spray mist collector, and the surrounding area.
- 2.8.2 The work piece holders must be cleaned regularly.
- 2.6.2 Ensure that the spray area is properly ventilated during cleaning procedures.
- 2.6.3 Ensure that only electrically conductive solvent containers are being used and that the containers are properly grounded.
- 2.6.4 Prior to start cleaning the high voltage conducting parts with flammable solvents ensure that the discharge energy must not exceed 0,24 mJ. For the practical use this means that the system must be grounded.

2.7 Conditions for Using the Spray Booth

- 2.7.1 Always ensure that the spray area is properly ventilated and that the solvent concentration in the breathing air is not damaging to health.
- 2.7.2 Ensure that the floor of the spray booth is electrostatic conductive.
- 2.7.3 Always ensure that no person remains in the spray booth during the spraying process.
- 2.7.4 Ensure that the discharge energy which will be drawn off the high voltage circuit is <0,24mJ, if flammable liquids are being used for cleaning procedures.

2.8 Personal Protective Equipment

- 2.10.1 Ensure that all persons working with electrostatic spraying systems and all persons in the area of the electrostatic conductive floor wear antistatic shoes.
- 2.10.2 If protective gloves are necessary these gloves must be antistatic or similarly effective.

2.9 Operation with Ignition Hazard

- 2.11.1 It is the responsibility of the user to ensure that no work with ignition hazard is done in rooms at risk of fire or in potentially explosive atmospheres. Exceptions will only be possible if special protective measurements were taken (for example: removal of liquid spraying material, solvent, and other flammable goods. Cleaning of all systems and parts of the building. Proper ventilation etc.).
- 2.11.2 Always ensure that next to potentially explosive rooms and areas operation with ignition hazard must only be carried out, if ignition sources cannot enter these rooms and areas.

3 ATEX

3.1 European ATEX Directive

EUROPEAN ATEX DIRECTIVE 94/9/EC, ANNEX II, 1.0.6

The following instructions apply to equipment covered by certificate number Siral ATEX

1. The equipment may be used with flammable gases and vapors with apparatus groups II and with temperature class T6.

2. The equipment is only certified for use in ambient temperatures in the range 0°C to +40°C and should not be used outside this range.

3. Installation shall be carried out by suitably trained personnel in accordance with the applicable code of practice e.g. EN 60079-14:1997.

4. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice e.g. EN 60079-17.

5. Repair of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice e.g. EN 60079-19.

6. Putting into service, use, assembling, and adjustment of the equipment shall be fitted by suitably trained personnel in accordance with the manufacturer's documentation.

Refer to the 'Table of Contents' of this service manual.

- a. Installation
- b. Operation
- c. Maintenance
- d. Parts Identification

7. Components to be incorporated into or used as replacement parts of the equipment shall be fitted by suitably trained personnel in accordance with the manufacturer's documentation.

8. The certification of this equipment relies upon the following materials used in its construction:

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection provided by the equipment is not compromised.

Aggressive substances: e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

Suitable precautions: e.g. regular checks as part of routine inspections or establishing from the material's data sheets that it is resistant to specific chemicals.

Refer to 'Specifications' in the 'Introduction' section:

- a. All fluid passages contain stainless steel or nylon fittings.
- b. High voltage cascade is encapsulated with a solvent resistant epoxy.

9. A recapitulation of the certification marking is detailed in the 'ATEX' section, on the next page,

10. The characteristics of the equipment shall be detailed e.g. electrical, pressure, and voltage parameters.

The manufacturer should note that, on being put into service, the equipment must be accompanied by a translation of the instructions in the language or languages of the country in which the equipment is to be used and by the instructions in the original language.

3.2 EstaQuick AEMD-600 ATEX Product Marking Definitions



Note

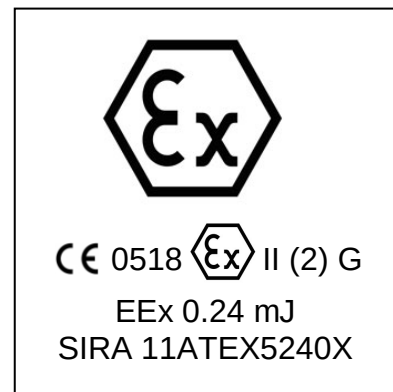
ATEX APPROVAL with the Power Source 9060 LOW VOLTAGE CONTROL UNIT KIT is only use for the Electrostatic Automatic Applicator AEMD-600 incl. Machine Mounted Adapter AEMD-4500-6.

EstaQuick AEMD-600 ATEX Product Marking Definitions

Ex Certificate Number: Sira 11ATEX5240X

Sira = Notified Body performing EC-type Examination
 11 = Year of certification
 ATEX = Reference to ATEX Directive
 5 = Protection Concept Code (code 5 is titled Encapsulation)
 240 = Document serial number
 X = Special conditions for safe use apply
 Special condtions for safe use:

The applicator AEMD-600
 Shall only be used with
 Air- & Fluid hoses that meet
 Safety requirements



Product Marking



Ex = Specific marking of explosive protection
 II = Equipment Group hazardous area characteristics
 2 = Equipment Category
 G = Type of explosive atmosphere (gases, vapors, or mists)

EEX0.24mJ = The EstaQuick AEMD-600 applicator is suitable for use in automatic spraying installations Complying with EN 50 050 as they are a Type A class With a discharge energy limit of 0.24mJ.

3.3 Tests

- 3.3.1 An automatic (stationary) spray installation for electrostatic spraying of coating materials must be tested by an expert prior to initial start-up.
- 3.3.2 Method, scope, and frequency of tests have to be determined by the user based on the individual production requirements and local conditions. In the individual case the professional trade association may require a written proof in form of a test book, EDP report, or similar.
- 3.3.3 Ensure that electrostatic spraying systems and installations and accessory parts be checked by an expert for safe operation whenever necessary, but at least once a year. This examination must be documented in writing.
- 3.3.4 The following checks must be carried out by a qualified electrician¹:

	Test Cycle	
	daily	weekly
drawing-off air conveyance for efficiency	X	
Proper functioning of protection against over-current	X	
Protection against exceeded discharge energy		X
Protection against ignition of flammable cleaning materials		X
Efficiency of protection measurements against direct touch		X
Efficiency of grounding measurements	X	
Isolation of all live installation components above 1kV		X
Locking device, passing protection		X

- Keep ready access to appropriate fire extinguishing equipment. Check fire extinguishing equipment regularly, at least every 2 years. All personnel must be adequately trained with fire extinguishing equipment.
- Keep ready an actual warning schedule showing the type of alarm and the triggering function (manually / automatically).

¹ A qualified electrician is a person who has specialist training, knowledge, and experience as well as knowledge of the relevant rules and who can recognize and judge possible hazards of the works involved. (See § 2 Par. 3 UVV VBG 4). Furthermore a qualified electrician must have the following qualifications: Specialist training and knowledge of explosion protection, electrostatic process technology, knowledge of local conditions, knowledge of the electric installation, and knowledge of the load of electric installation.

4 Specification

Atomization:	Conventional air atomizing 0 to 9 bar
Fluid pressure:	0 to 7 bar
Cylinder air pressure:	7 bar
Tip voltage:	max. 90 kV DC voltage
Current max.:	120 μ A
Voltage input:	220V at 50/60Hz
Gun weight:	245 g
Dimensions	125 x 46 x 56 mm
Material:	PEEK / POM / Stainless Steel

5 Design

5.1 Different Models

The EstaQuick is available in different versions. These differ from different tips respectively different fluid feed versions. Please see the Tip and Air Cap Selection Chart for selection of fluid tips and air caps. The selection of the correct atomizer depends on the desired finish quality, the geometry of parts, and the paint viscosity. For this reason a test should be carried out with different fluid tips and fluid feed versions.



Information

For more information please note page 35.

6 Installation

6.1 Connection of EstaQuick AEMD-600 to Adapter AEMD-4500-6

Insert the EstaQuick AEMD-600 with the locking device into the designated place by a turn of 45° to its later position. Push the gun body onto the adapter whereby the resistance of the spring must be surmounted. Turn the gun clockwise by 45° in its position until it locks into the adapter.



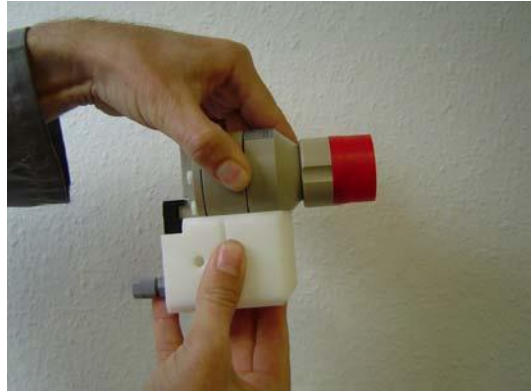
Position the gun by 45° to the adapter



Insert the locking device into the seat



Push the gun downward against the spring force until it bottoms on the adapter



Click the gun into the rear locking device until it sits straight

6.2 Screwed connection of EstaQuick AEMD-600-FIX to Adapter AEMD-4500-6-FIX

In case of screwed connection insert the gun with the locking device into the designated place by a turn of 45° to its later position. Push the gun body onto the adapter whereby the resistance of the spring must be surmounted. Turn the gun clockwise by 45° in its position and fix it with the two screws in the front and back.



Position the gun by 45° to the adapter



Insert the locking device into the seat



Push the gun downward against the spring force until it bottoms on the adapter



Click the gun into the rear locking device until it sits straight



Fix the gun at the back with screw (POS.22)



Fix the gun at the front with the screw (POS.21)



Note

Before installing the gun apply a light coat of grease to the O-rings to prevent from shearing off.

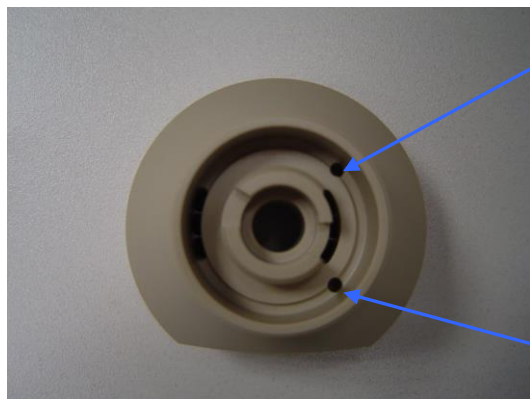
6.3 ***Spray Pattern Adjustment***

The spray pattern of the atomizer is adjustable from round pattern to flat pattern.

By increasing the air supply (atomizing air) the pattern becomes wider, by reducing the air supply (atomizing air) it becomes more narrow.

Carry out tests in order to find the desired values.

In order to change-over the atomizer spray pattern from horizontal to vertical, reposition the baffle in the spray head. There are two position bores in the spray head (see picture).



Position for vertical spray pattern

Position for horizontal spray pattern



Note

For optimum finish quality always operate with clean, dry, and filtered air.

6.4 ***Distance of Gun to Work Piece***

To achieve optimum finish quality, position the gun approximately 15 to 30 cm from the work piece.



Caution

The distance from the gun to mass must be significantly larger than the distance from the gun to the object to be coated.

7 Preventive Maintenance



Caution

Never use a faulty spray gun!

7.1 Maintenance Schedule

For longer service life of the gun and for safe use of the spray installation this maintenance schedule must be followed:

7.1.1 Several Times Daily

- Turn off the high voltage.
- Check the air cap, spray tip, and electrode for paint residues. Clean as often as necessary with a soft brush and a suitable solvent and blow dry.
- Clean all insulated surfaces of the installation. Remove paint residues from the gun exterior, the high voltage cable, and the air- and fluid hoses with a solvent wetted cloth.
- Make sure the solvent is non-polar
- Make sure that solvent has a flash temperature below temperature in booth

7.1.2 Daily (At the Begin of Each Shift)

- Either remove or ground all loose or non-grounded objects in the surroundings of 6 meters of the operating range of the gun.
- Check whether the atomizer head and the gun electrode are clean and not damaged.



Information

- Never remove the fluid tip if there is still fluid in the gun, otherwise fluid can enter the air passages. In order to remove the fluid tip / air cap hold the gun downward. Clogged air passages will cause improper atomization and might lead to short-circuit. If the air passages are clogged with conductive fluid, this will lead to increased current output and low operating voltage, and might finally damage the electrical components.
- For maintenance of the atomizer please refer to the chapter „Cleaning of the Atomizer“.



Note

In order to change the fluid tip, pressure must be applied to the needle.

7.1.3 During Operating Interruption (and at the End of Each Shift)

1. Turn off the high voltage.
2. Turn off material supply.
3. Turn off atomizing air and cylinder air.
4. Clean gun, cable, and hoses with a solvent wetted cloth. Use suitable solvent only.
5. Empty the fluid lines and leave solvent in the non-pressurized lines. (See the chapter „Flushing Procedure“).



Caution

- For a short operating interruption (shorter than the respective pot-life of the fluid) it might not be necessary to flush the lines, depending on the coating material being used. If the solid particles of the fluid deposit slowly, the lines must not be flushed so quickly after an operating interruption as it would be the case with quickly depositing solid particles.
- The necessity for flushing depends on the coating material and on the time of the operating interruption.
- Metallic paints and primer will need more frequent flushing than some other paints.

7.1.4 Weekly

- Check the complete system for damage, leakage, and paint residues.
- Clean the atomizer unit.



Information

If quickly depositing material is being sprayed and the lines are not flushed frequently enough, the fluid passages of the gun and the lines may get clogged, resulting in more time consuming maintenance and repair.

8 Cleaning Procedures

8.1 Cleaning the Atomizer

For regular cleaning procedures the following tools are needed:

- Suitable solvent
- Grounded solvent supply
- A brush with soft bristles
- Some pipe-cleaners

For safe and trouble-free operation keep the exterior surface of the gun clean and free of paint residues and dirt. This is to prevent high voltage loss to ground and reduction of the electrostatic effect. Contamination at the opening of the air cap will cause a reduction of atomizing quality. Clean the air cap as often as necessary with a soft brush and solvent in order to obtain optimum atomization..



Caution

Never wrap the gun into plastic film. A surface charging can be built up at the plastic material and might discharge to the next grounded object. This reduces the capacity of the gun which might lead to damaging the component FINISHING BRANDS GERMANY GmbH will not be liable for any damages caused by wrapping the gun into plastic film. To protect the gun use the gun protection (AGMD-400).

8.1.1 Cleaning the Air Cap

To clean the air cap the following steps have to be performed:

1. Turn off the high voltage.
2. Turn off the material supply.
3. Clean the removed parts with a soft brush and suitable solvent.



Caution

Never use metal tools or metal brushes. For cleaning purposes never use any object that is harder than the plastic parts. If it is impossible to remove paint residues with a cloth or with a brush, the parts may be soaked in solvent, but only as long until the residues can be removed! Never soak the gun body, hoses, or the high voltage cable in solvent!

8.2 Flushing Process

1. Turn off the high voltage.
2. Turn off the material supply.
3. Turn off atomizing and fan control air.
4. Connect solvent supply to the gun.
5. Flush the system with solvent until clean solvent escapes.
6. Remove the solvent supply.
7. Activate the gun until there is no solvent left. After finishing these steps the gun will be ready for color change, storage, or maintenance.

9 Failures

9.1 Troubleshooting Chart

General Problem	Possible Cause	Solution
Faulty Spray Pattern		
Asymmetric Shape	1. Air hose of the remote air supply to air valve obstructed or damaged. 2. Air channel and/or air inlet obstructed.	Clean, replace or repair. Blow out or clean.
Unclean left or right side pattern	1. Air cap damaged or obstructed.	Replace or clean.
Very uneven or deformed spray pattern.	1. Wrong air cap / fluid tip combination. 2. Air and fluid not synchronized.	Select the correct combination. Check the programming sequence.
Insufficient Supply		
Atomizing Air	1. Air channel in gun or in air line obstructed. 2. Pressure too low.	Blow out. Increase air pressure.
Fluid Output	1. Fluid tip obstructed or damaged. 2. Fluid channels in gun or fluid line obstructed. 3. Not enough travel of fluid valve needle. 4. Fluid pressure too low. 5. Fluid filter obstructed. 6. Fluid valve or fluid regulator obstructed.	Flush or replace. Flush. Lubricate piston and needle packing. Increase fluid pressure. Clean or replace. Clean.
Leakages		
Air escapes	1. Air valve cap loose or damaged.	Tighten.
Fluid leakage at rear part of the gun.	1. Packing, piston, needle or electrode damaged.	Replace faulty components.
Fluid leakage between gun and adapter.	1. O-Rings AGMD-93 damaged or missing. 2. Locking device does not seal properly. 3. Insulating surface between head, head bracket, and end plate is not even.	Insert O-Rings Tighten cap screw AEMD-2130. Loosen 6 screws, align parts and tighten screws.
Fluid leakage at fluid tip	1. Fluid tip too loose. 2. Needle and tips do not close properly. 3. Retaining ring loose.	Engage fluid tip. Replace damaged components. Tighten retaining ring.
Continuous leakage at fluid tip.	1. Seat of fluid tip worn or damaged. 2. Needle / electrode worn or damaged. 3. Fluid tip not engaged. 4. Needle does not close (cylinder air line not deventilated)	Replace fluid tip. Replace faulty part. Engage fluid tip. Check valve.

Electrical Problems		
Wrap back	1. Insufficient grounding of the work piece. 2. Insufficient booth ventilation. 3. Too much atomizing air.	Check and correct. Check and correct. Reduce pressure.
Insufficient or no high voltage.	1. Faulty high voltage connections. 2. Line passage between transformer and electrode interrupted. 3. Insufficient or no grounding. 4. Faulty pressure switch. 5. High voltage cable damaged. 6. High voltage transformer damaged. 7. Check fuse. 8. Is the voltage turned on? Is the atomizing air turned on? Is the gun activated? Is the paint too conductive?	Check and connect to adapter and high voltage transformer. Check and correct. Check and correct. Replace. Replace. Please see Service Manual for the high voltage transformer. Check. Check.
High Make Impulse	1. Paint in the air channels. 2. Paint in the rear part of the gun.	Clean air channels with soft brush. See <i>Leakages</i>.

10 Service



Information

Only use genuine spare parts when servicing the EstaQuick.



Note

All personnel should read and understand this Service Manual prior to starting maintenance and service.

10.1 Disassembling the Gun from the Adapter



Caution

When servicing the gun always turn off and ground the high voltage, turn off the material supply, and relieve pressure from the material supply.

10.1.1 Preparations

To take off the gun from the adapter the following steps have to be followed:

1. Turn off high voltage.
2. Turn off material supply.
3. Turn off atomizing air and cylinder air.
4. Clean gun, cable, and hoses with a solvent wetted cloth. Use suitable solvent only.
5. Empty the fluid lines and leave solvent in the non-pressurized lines.

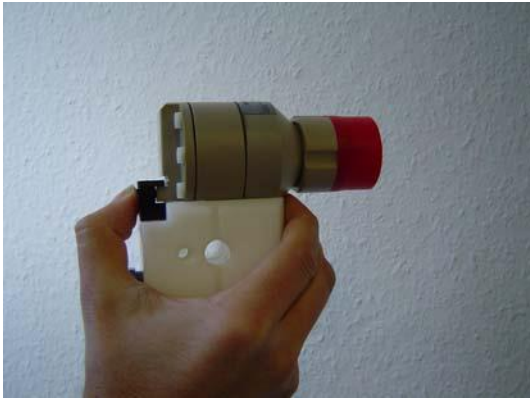


Caution

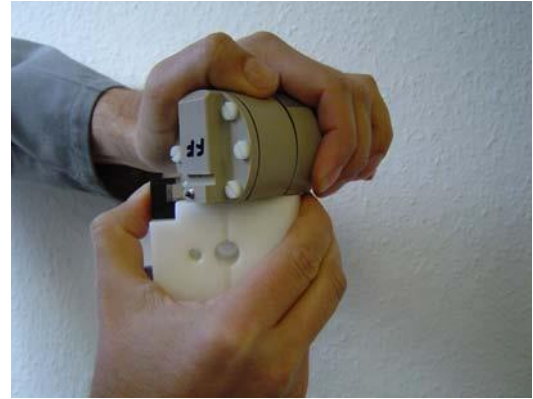
Prior to cleaning or color change turn off the high voltage and the supply voltage to the high voltage transformer.

10.1.2 Removal of the EstaQuick AEMD-600

Activate the spring pad at the adapter, at the same time the spring pad will be pushed into the gun and the gun body can now be turned out of the adapter. Turn the gun body by 45° counter-clockwise. The gun can now be pulled off upward and the spare gun can be connected.



Push in the spring pad at the adapter



Turn gun by 45° counter-clockwise and pull off upward

10.1.3 Removal of the EstaQuick AEMD-600-FIX

Remove first the two screws who fix the gun on the adapter. The gun body can now be turned out of the adapter. Turn the gun body by 45° counter-clockwise. The gun can now be pulled off upward and the spare gun can be connected.



Remove the two screws in front and back



Turn gun by 45° counter-clockwise and pull off upward

10.2 Disassembling the EstaQuick AEMD-600

For disassembly and assembly please refer to Parts Lists and Exploded View in this Service Manual.



Information

Disassembly and assembly of parts must only be carried out by adequately trained personnel. Works must be carried out on a clean and flat supporting surface.

10.2.1 Necessary Tools

- Test adapter
- Screw driver
- Tip wrench (AEMD-101)
- Allen screw wrench (SW 6)
- Ring spanner (SW 3)
- Multimeter
- Calliper gauge

10.2.2 Grease and Bonding Agent

- AGMD-010: for needle, needle packing and piston.
- Electrostatic Grease (Order No. 59972-00): for O-Rings, packing, and hollow spaces.
- LOCTITE 243 (screw locking “middle strength”)
- LOCTITE 222 (screw locking “light strength”)



Information

Needle, needle packing and piston must only be lubricated with grease AGMD-010. Any other grease can lead to gun failure (needle packing and piston might swell if improper grease is being used).

Once the gun has been disconnected from the adapter and has been replaced by a spare gun, the spraying operation can be continued, and the disconnected gun can be serviced at a suitable place.

For disassembly the following steps have to be followed:

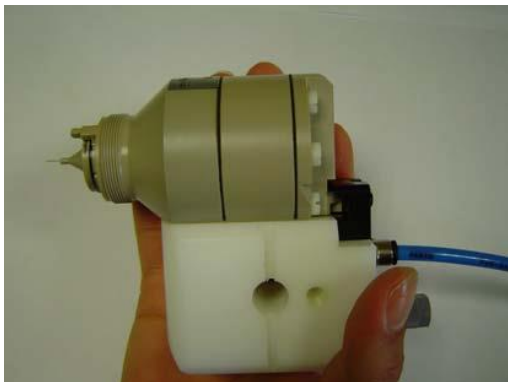
1. Connect the gun to be serviced onto a test adapter. Apply cylinder air with 6 bar pressure to the needle, this pushes the needle toward the springs and relieves the tip.



Caution

In order to protect the gun head from damages it is important that pressure air (min. 6 bar) is applied to the needle during the disassembly of the air cap and tip.

2. Loosen the retaining ring (Pos.15) and remove the air cap (Pos.14).
3. Only exchange the tip (Pos.13) by hand or use the tip wrench AEMD-101. It can be loosened by a light pressure and a ¼-turn counter clockwise. (See Pictures).



Apply pressure of 6 bar to the gun



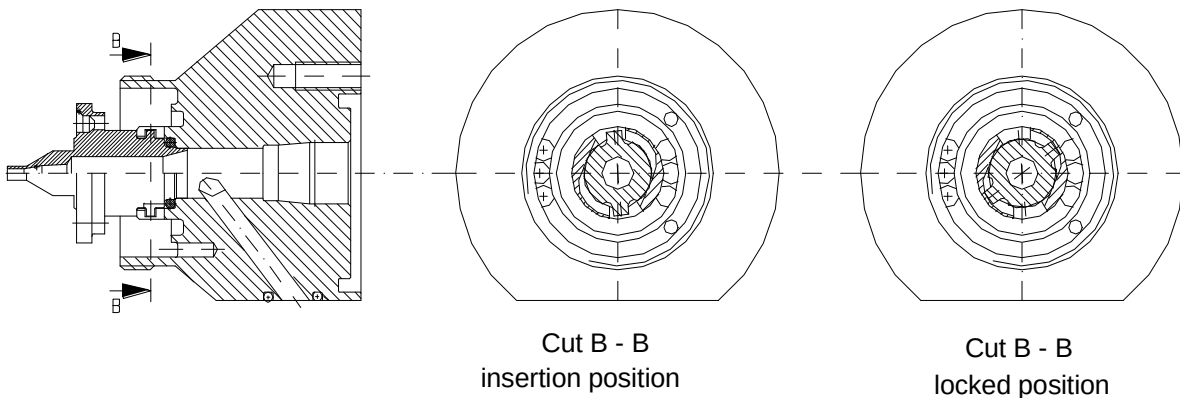
Disassembly with fingers



Disassembly with tip wrench AEMD-101



Wrong: Disassembly with pliers or other tool



4. Remove the baffle (Pos.11) and the O-Rings (Pos.24 and 26).
5. Relieve pressure from the test adapter and remove the gun.
6. Loosen the electrode (17.2) from the needle (17.1).
7. Firmly hold gun head (Pos.1) and head bracket (Pos.2) and carefully and evenly loosen the 6 connecting screws (Pos.23). Remove the end plate (Pos.3) from the head bracket (Pos.2).
8. Remove the pressure springs (Pos.19 and 20), the spring bolt / fluid needle assy. (Pos.18/17.1) and the piston (Pos.16). Remove the washer for the end plate (Pos.5).



Information

The fluid needle (Pos. 17.1) is glued into the spring bolt (Pos. 18) with LOCTITE 243. The positions 17.1 and 18 are one unit.

9. Disconnect the gun head (Pos. 1) from the head bracket (Pos. 2). Remove the contact lock (Pos. 10).



Information

The contact wire (Pos. 9) will remain in the head.

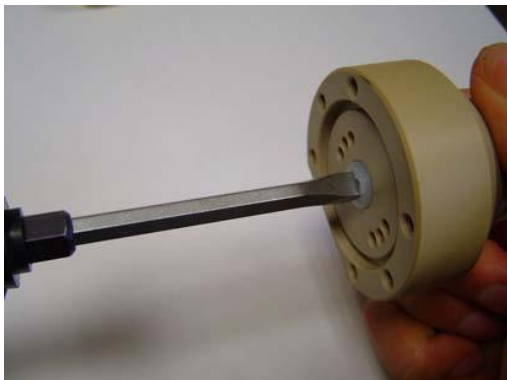
10. Remove the washer (Pos. 4) and both R-Rings (Pos. 24)
11. The needle packing (Pos. 8) must be exchanged at each disassembly. It will be destroyed at disassembly (see picture).



Insert screw driver



Force screw driver with light blows of the hammer into needle packing



Unscrew faulty needle packing

12. The locking device (Pos. 6) and the cap screw (Pos. 7) will remain in the head.



Information

An electrical contact must exist between cap screw (Pos. 7) and contact wire (Pos. 9). Check this contact with a multimeter.

10.3 Cleaning and Examination of Gun Parts

After disassembly clean the gun parts at first and then check for proper condition.

10.3.1 Cleaning of Parts



Information

The kind of contamination of the gun parts might give an indication for gun failure.

For regular cleaning procedures the following tools are needed:

- Suitable solvent
- Grounded solvent supply
- A brush with soft bristles
- Some pipe-cleaners

Clean the contaminated gun parts with a soft brush and suitable solvent and blow dry. Clean the air- and fluid bores with a solvent soaked pipe-cleaner.



Information

Do not “bath” the gun parts in solvent but wipe them clean with a brush or an soaked cloth.

For safe and trouble-free operation keep the exterior surface of the gun clean and free of paint residues and dirt. This is to prevent high voltage loss to ground and reduction of the electrostatic effect. Contamination at the opening of the air cap will cause a reduction of atomizing quality. Clean the air cap as often as necessary with a soft brush and solvent in order to obtain optimum atomization.

10.3.2 Examination of Parts

Prior to assembly of the gun all gun parts must be checked. Faulty components must be replaced.



Caution

Never install faulty components into the gun!



Caution

Only use genuine Ransburg spare parts!

10.4 Assembly of the EstaQuick AEMD-600

This describes the assembly of a gun with new parts. For the renewed assembly of a gun, some parts will remain and will not have to be assembled again.

10.4.1 Preparation of the Assembly „Head“

1. Screw the needle packing (Pos.8) into the head (Pos.1) by use of an Allen screw wrench (SW 6), take care not to close the fluid bore in the head.

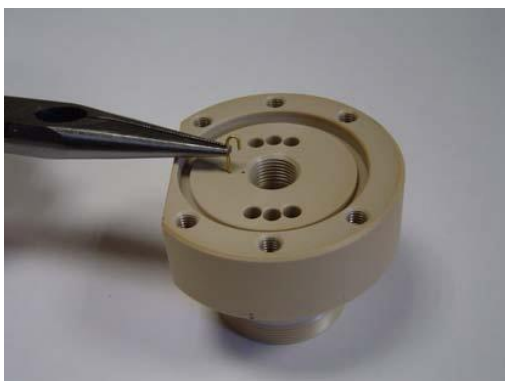


Right: Needle packing sits below the fluid bore



Wrong: Needle packing closes the fluid bore

2. Insert the contact wire (Pos. 9) into the bores and secure with light blows of the hammer.

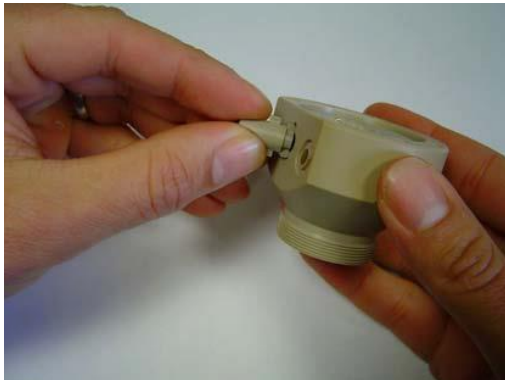


Insert contact wire

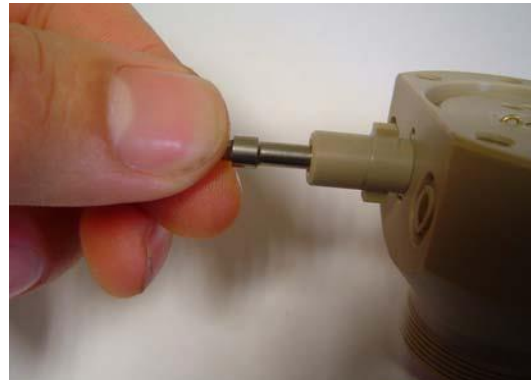


Secure contact wire with light blows of the hammer

3. Insert the locking device (Pos.6) into its place in the head (Pos.1) and tighten with cap screw (Pos.7). Check the electrical contact between cap screw (Pos.7) and contact wire (Pos.9) with the multimeter.



Insert locking device



Screw in cap screw



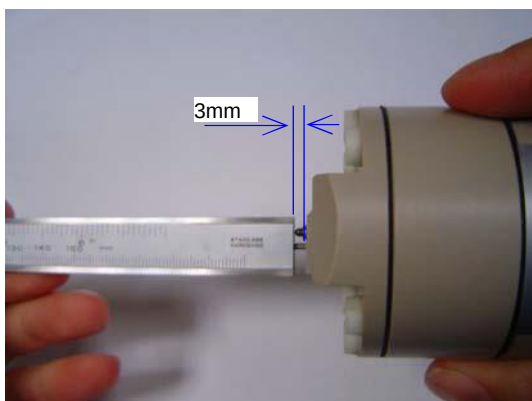
Tighten cap screw



Check the electrical contact between wire and cap screw

10.4.2 Preparation of the Assembly „End Plate“

4. Screw the spring pas (Pos.22) into the end plate (Pos.3), so that the ball shows for 3mm.



5. Counter the adjusted spring pad with the set screw (Pos. 21)

10.4.3 Preparation of the Assembly „Head Bracket“

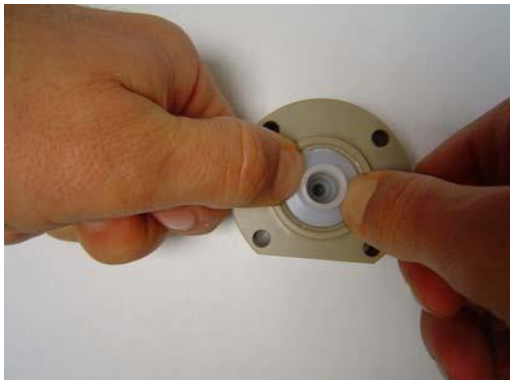
6. Lubricate the running surface of the piston in the head bracket (Pos.2) and the two running surfaces of the piston (Pos.16) with grease AGMD-010.
7. Press the piston into the head bracket.



Grease running surface of the piston in the Head bracket



Grease running surfaces of the piston



Press in the piston

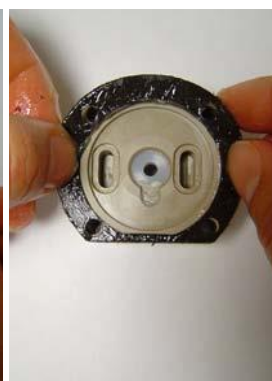
8. Lubricate the washers for head and endplate (Pos.4 and 5) with electrostatic grease.
9. Insert the greased washers into the respective groove in the head bracket (Pos.2).



Lubricating the washers



Inserting the washers



Insert the O-Rings (Pos.24)

10. The needle shaft (Pos.17) will be glued into the spring bolt (Pos.18) with LOCTITE „middle strong“.

10.4.4 Final Assembly of the EstaQuick AEMD-600

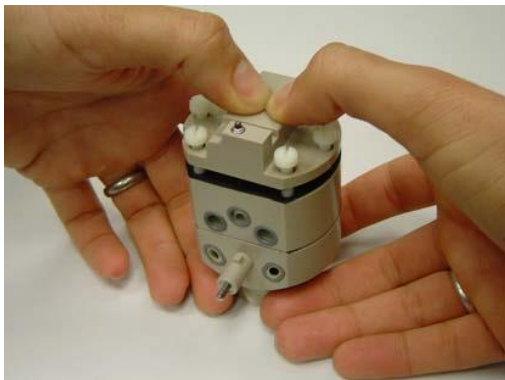
11. Insert the contact lock (Pos.10) into the needle packing (Pos.8) of the head (Pos.1).
12. Place the head bracket (Pos.2) onto the head (Pos.1).



Caution

The head bracket has a pocket into which the contact lock has to be inserted.

13. Push the needle shaft / spring bolt unit (Pos.17/18) into the bore of the piston (Pos.15) until you feel resistance.
14. Place the two pressure springs (Pos.19 and 20) onto the spring bolt (Pos.18).
15. Insert the 6 screws (Pos.23) into the designed bores in the end plate (Pos.3).
16. Position the end plate with the screws onto the head bracket.
17. Push the end plate downward, thereby strength must be surmounted in order to press the needle into the needle packing.
18. Lightly and evenly tighten the 6 screws (Pos.23) crosswise.
19. Check the levelness of the sealing surface of the head (Pos.1), of the head bracket (Pos.2), and of the end plate (Pos.3) with a calliper gauge or an angle. Then firmly tighten screws (Pos.23).



Push end plate downward



Check for levelness with the calliper gauge

20. Screw the electrode (16) with LOCTITE 222 (screw locking "light strong") onto the needle shaft (17) and tighten by hand.
21. Click the gun onto the test adapter and apply cylinder air of 6 bar.
22. Insert the baffle (Pos.11) into the head (Pos.1). Hereby it has to be decided whether a horizontal or vertical spray pattern is wanted, see Chapter 6.2 (Spray Pattern Adjustment).
23. Lubricate the disc washer (Pos.26) with electrostatic grease and install it onto the baffle (Pos.11).
24. Lubricate the O-Ring (24) with electrostatic grease and install it into its place in the tip.



Insert disc washer with tapered side into the groove of the baffle



Insert tip with lubricated O-Ring into the gun.



Information

For longer service life the O-Rings must always be lubricated. Never use faulty O-Rings.

25. Insert the tip (Pos. 13) with the guide pin into the bayonet of the head (Pos. 1). Push it downward with light strength and fix it to the head by a $\frac{1}{4}$ turn clockwise.



Information

The bayonet is only designed for fixing the tip and not for sealing. Only after the gun has been equipped with air cap and retaining ring, the tip is sealed to the head.



Caution

Prior to each assembly of the tip into the head, the seat of the electrode must be checked.

26. Install the air cap (Pos. 14) onto the gun, take care that the horns of the baffle engage into the slots of the air cap.
27. Screw on the retaining ring (Pos. 15). Check the position of the air cap, before tightening. Then tighten retaining ring by hand.



Insert the slots of the air cap into the horns of the baffle.



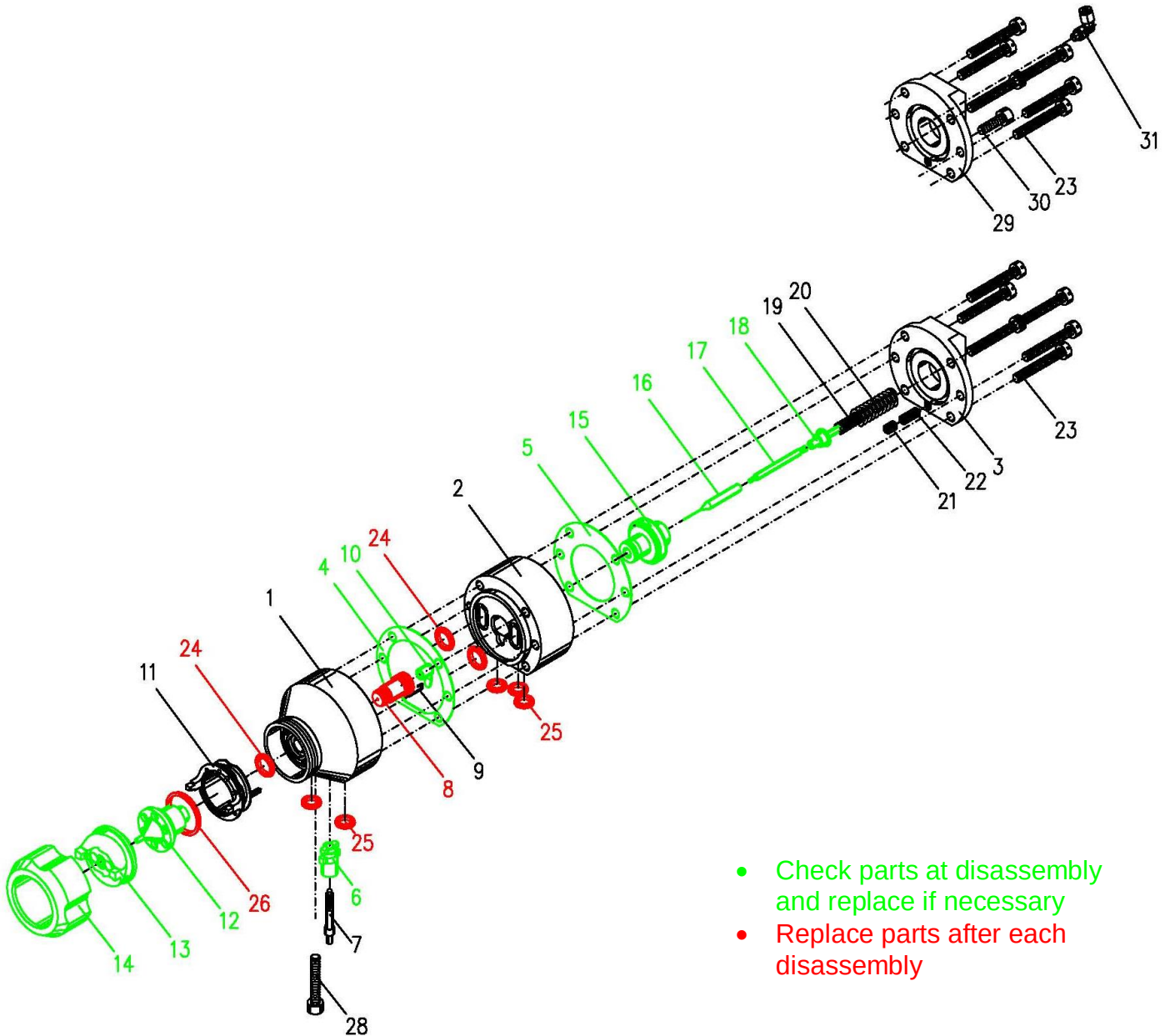
Check the position of the air cap while Screwing the retaining ring on.

28. Put the protective cap (Pos. 27) on the retaining ring to protect air cap and electrode.

11 Ordering of Spare Parts

Please have the Parts Lists in hand for ready reference of part numbers when ordering parts.

11.1 Exploded View EstaQuick AEMD-600



- Check parts at disassembly and replace if necessary
- Replace parts after each disassembly

11.2 Parts List

Parts List Electrostatic Automatic Applicator EstaQuick AEMD-600

Pos.	Description	Qty.	Part No.
1	Gun Head	1	AEMD-2196
or	Gun Head for Circulating	(1)	AEMD-2196-U
2	Head Bracket	1	AEMD-2220
3	End Plate	1	AEMD-2242
4	Washer For Head	1	AEMD-2216
5	Washer for End Plate	1	AEMD-2218
6	Locking Device	1	AEMD-2244
7	Cap Screw	1	AEMD-2130
8	Needle Packing	1	AGMD-405-1
9	Contact Wire	1	AEMD-2240
10	Contact Lock	1	AEMD-2241
11	Baffle	1	AEMD-2033
12	Tip	1	See Chart 11.3
13	Air Cap	1	See Chart 11.4
14	Retaining Ring	1	AEMD-2368
15	Piston	1	AGMD-243-1
16	Electrode and Resistor	1	70430-01
17	Needle Shaft	1	AEMD-2420
18	Spring Bolt	1	AEMD-2219
19	Pressure Spring	1	AGMD-110
20	Pressure Spring	1	AGMD-111
21	Set Screw	1	AGMD-116
22	Spring Pad	1	AGMD-115
23	Pan Head Screw	6	AEMD-2131
24	O-Ring	3	See Chart 11.5
25	O-Ring	5	See Chart 11.5
26	Disc Washer	1	AEMD-2065
27	Protective Cap (not shown)	1	7331-03
28	OPTION: Screw	1	AEMD-2131
29	OPTION: End Plate	1	AEMD-2242-1
30	OPTION: Screw	1	DIN84M5X16PAG
31	OPTION: Vent connection (connected only with End Plate AEMD-2242-1)	1	ESTA-408-4

Note: Pos. 28 – 30: Option for Electrostatic Automatic Applicator AEMD-600.....-800-FIX.
Screw Coupling with Machine Mounted Adapter AEMD-4500-6-FIX.

11.3 Tip Selection Chart

Tip Selection Chart							
Pos.	Description	Tip Size [mm]	Part No.	Air Cap	Visco- sity [sDIN4]	Fluid Flow [ml/min]	Spray Pattern [mm]
12	Tip with bore 0.8mm	0,8	AEMD-2915-G	AEMD-800C	18-35	250	355
	Tip with bore 1.1mm	1,1	AEMD-2915-FX	AEMD-800C	18-40	350	355
	Tip with bore 1.4mm	1,4	AEMD-2915-FF	AEMD-800C	18-50	350	355
	Tip with bore 1.6mm	1,6	AEMD-2915-FW	AEMD-800C	18-50	up to 700	355
	Round Pattern Tip	A=6,31 mm ²	AEMD-2941	AEMD-850	-	-	-
	Round Pattern Tip	A=7,22 mm	AEMD-2951	AEMD-850	-	-	-

11.4 Air Cap Selection Chart

Air Cap Selection Chart		
Pos.	Description	Part No.
13	Air Cap for Tip AEMD-2915	AEMD-800c
	Air Cap for Round Pattern Tip AEMD-2941 and AEMD-2951	AEMD-850

11.5 O-Ring Selection Chart

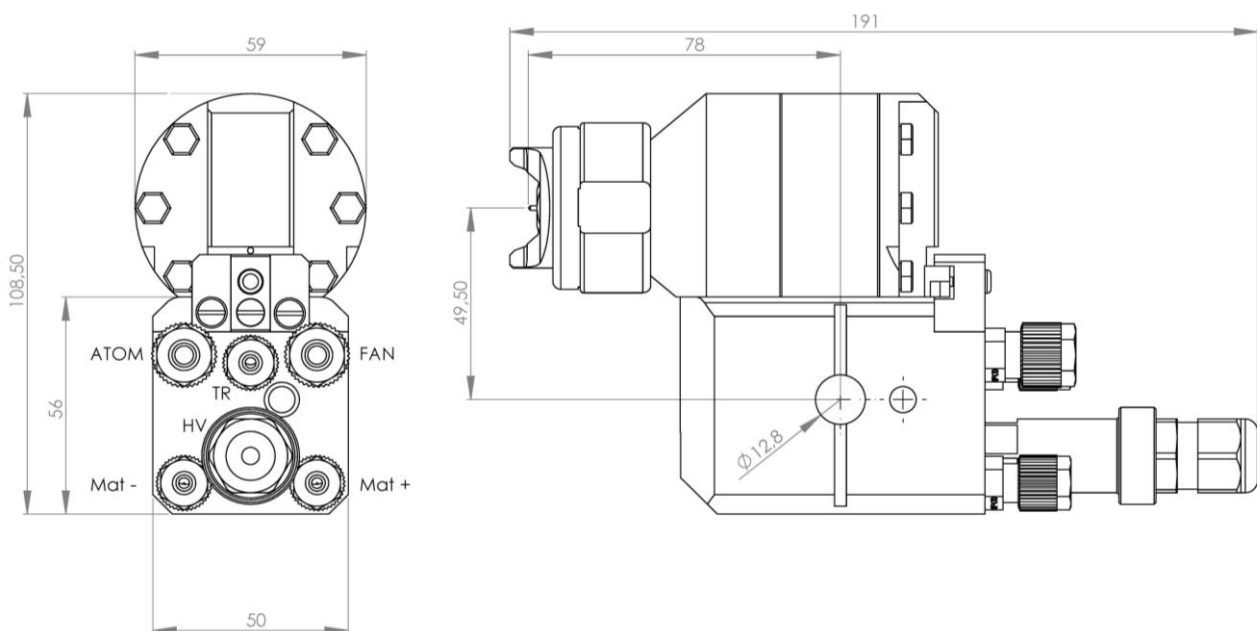
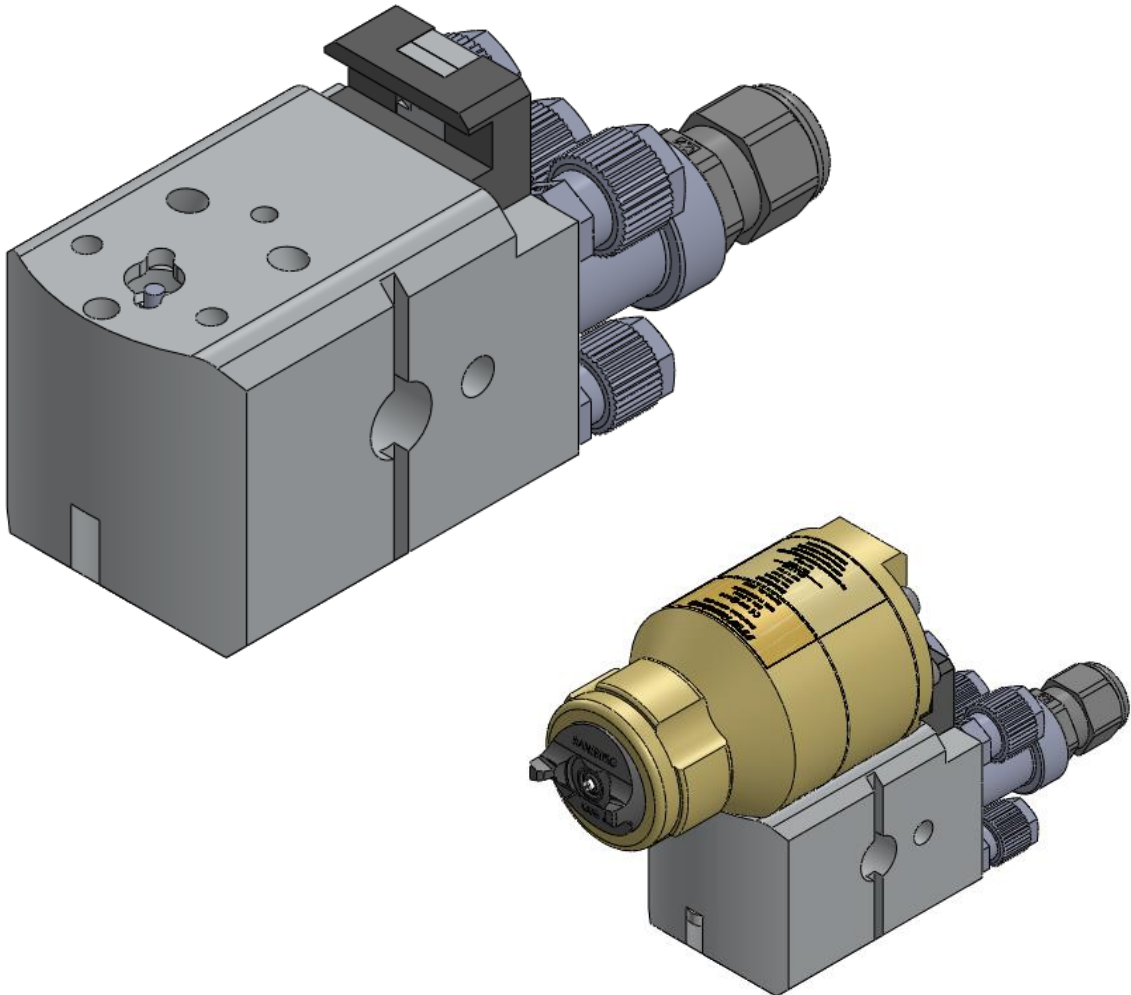
O-Ring Selection Chart		
Pos.	Description	Part No.
24	Standard O-Ring (Viton EX)	AGMD-121
	Option O-Ring for aggressive Solvent components, with Aromat, Esters and Keton	AGMD-121-C
25	Standard O-Ring (Viton EX) (5 parts per pack)	AGMD-93-K5
	Option O-Ring for aggressive Solvent components, with Aromat, Esters and Keton	AGMD-095

11.6 Selection Chart Automatic Applicator AEMD-600

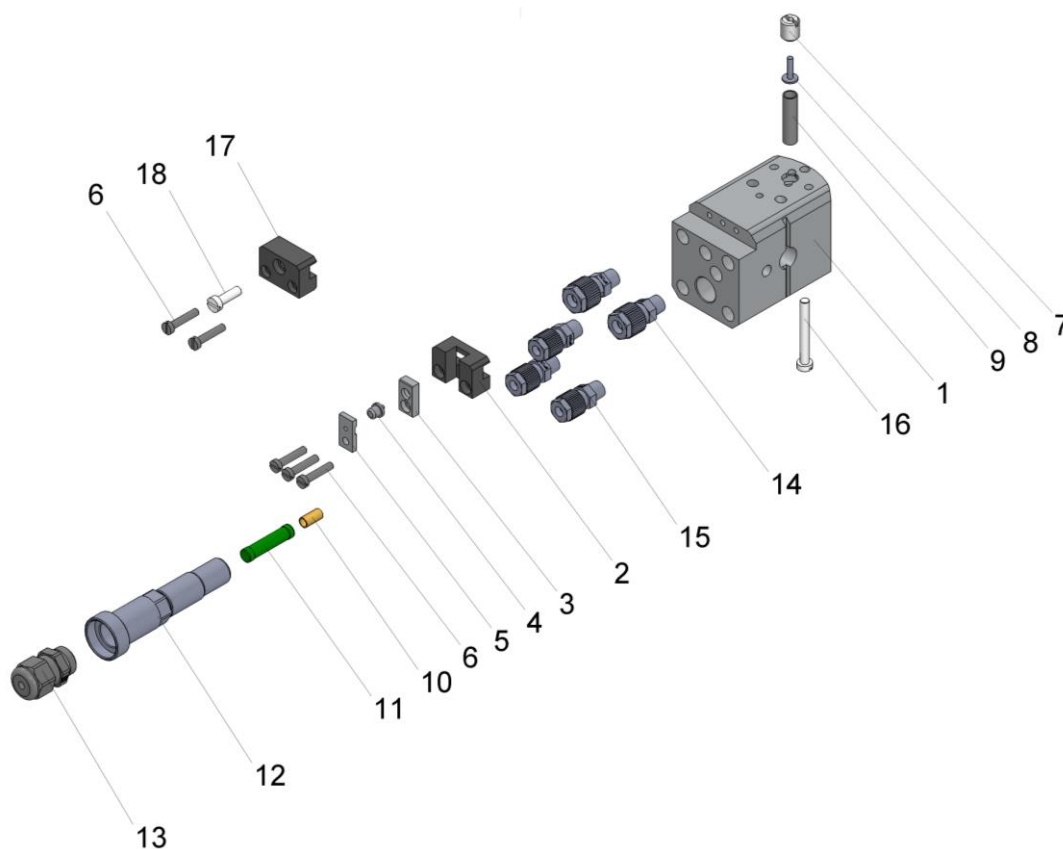
Automatic Applicator EstaQuick AEMD-600 Selection Chart					
	Description	Tip Size [mm]	Tip Size Part No.	Air Cap Part-No.	Machine Mounted Adaptor Part-No.
-Quick disconnection	AEMD-600-G-800	0,8	AEMD-2915-G	AEMD-800C	AEMD-4500-6
	AEMD-600-FX-800	1,1	AEMD-2915-FX		
	AEMD-600-FF-800	1,4	AEMD-2915-FF		
	AEMD-600-FW-800	1,6	AEMD-2915-FW		
	AEMD-600-2941-850	A=6,31 mm²	AEMD-2941	AEMD-850	
	AEMD-600-2951-850	A=7,22 mm²	AEMD-2951		
-Quick disconnection -Circulation U	AEMD-600UG-800	0,8	AEMD-2915-G	AEMD-800C	AEMD-4500-6
	AEMD-600UFX-800	1,1	AEMD-2915-FX		
	AEMD-600UFF-800	1,4	AEMD-2915-FF		
	AEMD-600UFW-800	1,6	AEMD-2915-FW		
	AEMD-600U2941-850	A=6,31 mm²	AEMD-2941	AEMD-850	
	AEMD-600U2951-850	A=7,22 mm	AEMD-2951		
-Fixed	AEMD-600-G-800-FIX	0,8	AEMD-2915-G	AEMD-800C	AEMD-4500-6-FIX
	AEMD-600-FX-800-FIX	1,1	AEMD-2915-FX		
	AEMD-600-FF-800-FIX	1,4	AEMD-2915-FF		
	AEMD-600-FW-800-FIX	1,6	AEMD-2915-FW		
	AEMD-600-2941-850-FI	A=6,31 mm²	AEMD-2941	AEMD-850	
	AEMD-600-2951-850-FI	A=7,22 mm²	AEMD-2951		
-Fixed -Circulation U	AEMD-600UG-800-FIX	0,8	AEMD-2915-G	AEMD-800C	AEMD-4500-6-FIX
	AEMD-600UFX-800-FIX	1,1	AEMD-2915-FX		
	AEMD-600UFF-800-FIX	1,4	AEMD-2915-FF		
	AEMD-600UFW-800-FIX	1,6	AEMD-2915-FW		
	AEMD-600U2941-850-FI	A=6,31 mm²	AEMD-2941	AEMD-850	
	AEMD-600U2951-850-FI	A=7,22 mm	AEMD-2951		

12 Machine Mounted Adapter

12.1 Machine Mounted Adapter AEMD-4500-6 for Electrostatic Automatic Gun AEMD-600



12.2 Exploded View Machine Mounted Adapter AEMD-4500-6



12.3 Parts List

Parts List Machine Mounted Adapter AEMD-4500-6

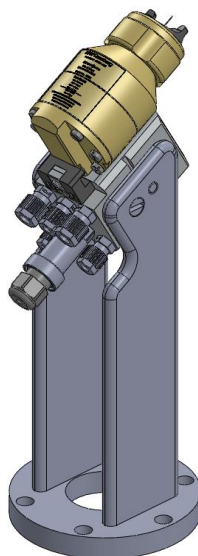
Pos.	Description	Qty.	Part No.
1	Base plate	1	AEMD-4501-6
2	Plate	1	AEMD-4102
3	Pressure plate	1	AEMD-4346
4	Pressure plate	1	AEMD-4247
5	Holding plate	1	AEMD-4246
6	Screw	2	AEMD-4129
7	Guide piece	1	AEMD-4502-1
8	Contact piston	1	AEMD-4503
9	Pressure spring	1	AEMD-2108
10	Pressure spring	1	AGMD-114
11	Resistor (60MΩ)	1	AEMD-4216
12	Cable gland	1	AEMD-4217
13	Strain relief	1	ST-M16x1,5
14	Hose fitting for 8mm (atom & fan)	2	AEMD-4134
15	Hose fitting for 6mm (needle pressure, paint in & out)	3	AEMD-4135
16	OPTION: Screw	1	AEMD-2131
17	OPTION: Plate	1	AEMD-4102-1
18	OPTION: Screw	1	DIN84M5X16PA

Note: Pos. 16 – 18: Option for Machine Mounted Adapter AEMD-4500-6-**FIX**.

Screw Coupling with Electrostatic Automatic Applicator AEMD-600.....-800-**FIX**.

13 Robot Mounted Adapter

13.1 Bracket

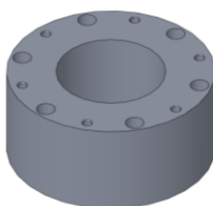


13.2 Parts List

Bracket for Machine Mounted Adapter AEMD-4500-6 Hollow Wrist Robot

<i>Pos.</i>	<i>Description</i>	<i>Qty.</i>	<i>Part No.</i>
1	Bracket (Applicator and Machine Mounted Adapter are not included)	1	AEMD-4250

13.3 Adapter



13.4 Parts List

Robot Adapter

<i>No.</i>	<i>Description</i>	<i>Qty.</i>	<i>Part No.</i>
1	Adapter ABB 5400, 580	1	AEMD-4260
2	Adapter ABB 5400 Enhanced Wrist	1	AEMD-4261
3	Adapter B&M LZ2000	1	AEMD-4263
4	Adapter Fanuc P-145/155	1	AEMD-4264
5	Adapter Fanuc P-200/250	1	AEMD-4265
7	Adapter Kawasaki KF192	1	AEMD-4266
8	Adapter Motoman EPX2850	1	AEMD-4267
9	Adapter Motoman EPX2900	1	AEMD-4268

14 Installation Low Voltage Control Unit



Note

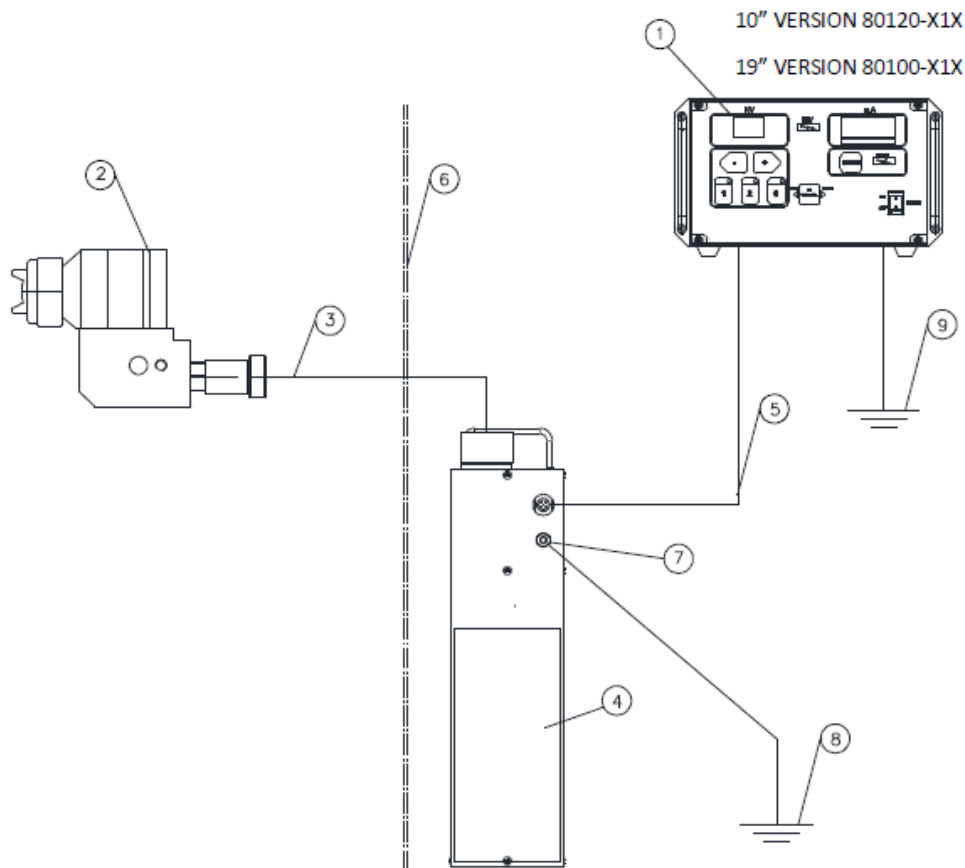
CE/ATEX APPROVAL WITH THIS POWER SOURCE IS ONLY FOR THE ELECTROSTATIC AUTOMATIC APPLICATOR AEMD-600 INCL. MACHINE MOUNTED ADAPTER AEMD-4500-6



Note

Installation of Low Voltage Control Unit see Service Manual CP-13-01.1

14.1 9060 Low Voltage Control Unit



Installation Low Voltage Control Unit

Pos.	Description
1	9060 Low Voltage Unit
2	AEMD-600 (ATEX approved) with Machine Adapter AEMD-4500-6
3	A10560-XXD High Voltage Cable
4	80104-01 External Cascade
5	79338-XX Low Voltage Cable
6	Booth Wall
7	Cascade Ground Connection
8	Cascade Separate True Earth Ground
9	Control Unit Separate True Earth Ground

14.2 9060 Low Voltage Control Unit Kit

Parts List 80143-ABC

Qty.	Part-No.	Description
1	Table A	9060 Low Voltage Control Unit
1	Table B	High Voltage Cable Assembly
1	Table C	Low Voltage Cable Assembly
1	80104-01	External Cascade 100kV

Table A – Unit Power Type

"A" Dash No.	Description	A
-1	110 / 120 V USA 10" Rack	80120-311
-2	220 / 240 V Europe 10" Rack	80120-312
-3	220 / 240 V China 10" Rack	80120-313
-4	110 / 120 V USA 19" Box	80100-311
-5	220 / 240 V Europe 19" Box	80100-312
-6	220 / 240 V China 19" Box	80100-313

Table B – High Voltage Cable

"B" Dash No.	Description	B
-1	High Voltage Cable-15` (5m)	A10560-15D
-2	High Voltage Cable-25` (8m)	A10560-25D
-3	High Voltage Cable-50` (15m)	A10560-50D
-4	High Voltage Cable-75` (22,5m)	A10560-75D

Table C – Low Voltage Cable

"C" Dash No.	Description	C
-1	Low Voltage Cable-10m	79338-10
-2	Low Voltage Cable-15m	79338-15

For ordering use 80143-ABC as indicated by Tables

- A Designates the 9060 Cascade Control Unit
- B Designates the High Voltage Cable Length
- C Designates the Low Voltage Cables Length

15 EC Manufacturer's Declaration

We Finishing Brands Germany GmbH
Justus-von-Liebig Str.31
D 63128 Dietzenbach

hereby declare under our sole responsibility that the product(s) listed below confirm with the relevant provisions of directive 94/9/EC of March 1994.

Product EstaQuick

Type AEMD-600 incl. AEMD-4500-6

Notified Body: Sira Certification Service (0518)
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

Conformity has been demonstrated with reference to the following documentation:

EC type examination certificate Sira 11ATEX5240X
Quality Assurance notification Sira 12ATEX M519

Compliance with the Essential Health & Safety Requirements has been assessed by reference to the following standards:

EN 50050:2006 Electrical apparatus for potentially explosive atmospheres –
Electrostatic hand-held spraying equipment

According to Annex II B of the EC Machine-Rule 2006/42/EG (MaschRL)
Applied Harmonized European Standard:

EN ISO 12100-1:2010 Safety of machines — basic concepts, general design
principles — Part 1: Basic terminology, methodology

EN ISO 12100-2:2010 Safety of machines — basic concepts, general design
principles — Part 2: Technical principles

EN 1953:2011 Atomizing and spraying equipment for coating materials - Safety
requirements

Dietzenbach, 27th of November 2012

^

Name and Position 
Dave Smith
General Manager

16 Product Liability and Warranty

Important Note for Product Liability

On the basis of a valid EC Rule dated January 1, 1990, the manufacturer is only then liable for his product if all parts are originally coming from the manufacturer or have been released by the manufacturer, respectively the equipment has been mounted and maintained properly. The use of other than the manufacturer's accessories and spare parts will void all warranties completely or partly.

We assume no liability for damage caused by the following reasons:

Inappropriate or improper use of the equipment, the use of other than FINISHING BRANDS GMBH GERMANY RANSBURG approved parts, incorrect assembly, respectively initial start-up by the purchaser or third parties, natural wear, as well as wear parts, incorrect operation or maintenance.

Finishing Brands Germany GmbH

Justus-von-Liebig-Str. 31

63128 Dietzenbach / Germany

Fon +49 6074 / 403-1

Fax +49 6074 / 403-281